

of San Luis Obispo, described for me the geology of the Pine Mountain fault zone where most of the cypresses occur and helped me to explore the Burnett Peak and Chris Flood Creek groves.

Creston Star Route
Paso Robles, California

CALIFORNIA BOTANICAL EXPLORERS—XII

WILLIS LINN JEPSON

John Milton Bigelow

[The following account of a significant portion of Bigelow's whereabouts and itinerary as a botanical traveler in central California is as pertinent and needful today as it was when Dr. Jepson originally wrote it, pin-pointing as it does the type localities of a number of well-known and more or less widespread species originally collected by Bigelow at the annoyingly elusive "Duffield's Ranch" of the Torrey account in the Pacific Railroad Reports. The first five paragraphs have already been published (in the twice resuscitated journal "Erythea," vol. 3, No. 13, pp. 102-104, Dec., 1938), this initial portion ending with the promise "to be continued." Inasmuch as this number of "Erythea" had a very limited circulation and is not likely to be available to many readers, the entire article, from a typescript copy recently come to light among Dr. Jepson's accumulated papers, is offered herewith.—R. BACIGALUPI, Curator, Jepson Herbarium, Department of Botany, University of California, Berkeley.]

The name of Bigelow is associated with many of the early discovered plant species of California. John Milton Bigelow was born at Peru, Bennington County, Vermont, on June 23, 1804. When he was eleven years old, his family moved to Ohio where he went to the public schools and attended the Medical College of Ohio, at which institution he was graduated March 8, 1832. In November of this same year, he was married to Maria R. Miers of Lancaster, Ohio, where he began the practice of medicine. In 1850 he was appointed surgeon to the Mexican Boundary Commission. While on duty with this survey, he collected and studied the native vegetation of the boundary. His specimens formed part of the material used by John Torrey in the preparation of the Report of the Mexican Boundary Survey (1859), which was under the charge of Major W. H. Emory. Bigelow's name is frequently cited in its pages. In 1853 Dr. Bigelow accepted the position of surgeon and botanist to the expedition of the Pacific Railroad Survey under Lieutenant A. W. Whipple, which left Fort Smith, Arkansas, and proceeded along the Canadian River and across the Llano Estacado to Albuquerque. The Rio Grande was crossed on November 10, 1853 and the expedition, following down the Bill Williams Fork, crossed the Colorado River at the mouth of Williams Fork on February 28, 1854, ferried it about sixty miles above and traversed the Mohave Desert to the Cajon Pass, thence to Los Angeles and San Pedro. Here the survey of Lieutenant Whipple ended; but it was

now the most favorable botanizing season in California and Dr. Bigelow in his own interest came north to San Francisco and Marin County to collect more fully the native vegetation of California. His zeal took him across the Great Valley into the Sierra Nevada where he remained until nearly June 1, 1854. He was not the first, but he was amongst the first explorers to botanize at all extensively in the Sierra Nevada. Of Bigelow's entire journey, John Torrey said that "his ample collections," made in 1853 and 1854, "were brought home in perfect order," and adds: "A number of new genera and more than sixty new species have been discovered by Dr. Bigelow, and he has added much valuable information upon many heretofore imperfectly known plants."

In the course of the years the student of California botany needs to consult and study repeatedly the pages of volume four of the Pacific Railroad Reports where, in about one hundred pages, John Torrey has given an account of the Bigelow plants supplemented by twenty-five very fine lithographic engravings. In the citation of localities for California, several extremely local place names occur which are not to be found on maps and which have been difficult to place. One of these is "Duffield's Ranch," which is important as the collecting station for a number of Bigelow plants and especially as the type locality for *Allium tribracteatum* Torr. and other plants then new to science.

To the systematic botanist whose initial or primary interest is in the living plant in its natural state, in its biology, ecological form and associates and habitat conditions, the type locality is vastly a more fruitful quest than the type specimens of early collectors, which are frequently unsatisfactory, fragmentary, or so decadent structurally as to be essentially useless. At the best the type specimen can usually do little more than enable one to make sure that a given binomial belongs to a particular unit; whereas the type locality opens up a new and living world whose potentialities may not be exhausted for years. It was for this reason, as well as for some uncertainties attaching to the identity of *Allium tribracteatum*, that I wished forty years ago to find Duffield ranch which is placed no more definitely in the text than "Sierra Nevada." The name could not be found on any available map or in any index, and constant inquiry amongst pioneers failed in like manner. Resort was then had to a stratagem. I took such dates as are given in Torrey's paper, arranged them in chronological sequence with their localities and I thus made an itinerary for Bigelow. It was soon found that the dates were not always dependable, but where the date agreed with the locality three times or more, it was used on the list. In this manner I obtained the following chronology: From April 4 to April 12, he was in Oakland and the Oakland Hills; April 17 and 18 at Point Reyes; April 20 at Corte Madera; April 25 to 27 in the Napa Valley; May 7 and 8, Stockton to Knights Ferry; May 9 at Sonora; May 10, 11, 12 at "Duffield's Ranch"; May 14, Carson's, Stanislaus River; May 14, Robinson Ferry, Stanislaus River, and

Murphy's Camp; May 15, Washington Mammoth Grove (Calaveras Grove); May 17, Mokelumne Hill; May 18, Ione Valley; May 19 and 20, Grass Valley; May 21, Nevada City and Downieville; May 23, Middle Yuba River; May 25, Marysville and Marysville Buttes.

This list made, it was a natural inference that Duffield ranch was somewhere between Sonora and the Stanislaus River or Murphy's Camp in Calaveras County. Any locality in this region was too low in altitude for the species concerned, so that the inference seemed in some way fallacious.

No systematic effort had been made to find Duffield ranch but for two decades the query had been kept in mind and used on any likely prospect or as a sort of poser to the geographically minded. Now that, in 1916, I had made a Bigelow calendar, a wider appeal was made to local historians and editors of newspapers in the foothill towns, but the effort again proved unavailing.

In 1918, my friend George James Peirce, Professor of Plant Physiology at Stanford University, was in Berkeley as Professor of Botany in the University of California Summer School. At my invitation, he joined in a week-end excursion to Sonora. We arrived in this county-seat town of Tuolumne County in mid-afternoon on the Fourth of July. It seemed that every old-timer on Sonora's High Street was, on this holiday, willing and anxious to tell us about Duffield ranch; it was out near the old Bob Finney place; it was on the Bald Mountain road; it was in this direction and that, in no case more than a few miles away. It developed at once that Duffield was a real character of the 1850's and a dead-shot. Ancient legends regarding him are still spun on the High Street. Finally we found Robert Marshall, a shrewd clear-headed "down-east" Yankee, ninety-one years old, who came to Sonora in the early 1850's, and who recalled with remarkable clearness the local events during the gold days. Said Marshall: "Yes, I knew Duffield. There is a Duffield Mine near Soulsbyville but no Duffield ranch." Then he went on to give an elaborate, particularized and colorful history of Duffield, his activities and associates. In the course of describing the personality of Duffield, he remarked that there was only one man whom Duffield feared, namely Ben Soulsby. "Was Ben Soulsby still living?" "Yes; Ben Soulsby lives in a cabin near Soulsbyville." We went to Soulsbyville, found the cabin a few miles from the village and found Ben Soulsby. When I told my errand he seated himself on a stone step in front of his cabin door. Seventy-eight years of age, he was as utterly distrustful of the stranger and as taciturn as Marshall in Sonora had been hospitable and loquacious. Little could be had from him save that there was no Duffield ranch, but that there was a Duffield mine. It was up the cañon a half-mile; the hole still there, any one could go look at it. Hereupon I played the only valuable card left me and which, it was felt, would be decisive one way or the other. It was obvious that of early events Soulsby's memory was clear and sharp. So I took from under my

arm a large volume which I had brought along, volume four of the Pacific Railroad Reports. I opened the book to a marked page, placed it in Soulsby's hands and pointed to "Duffield's Ranch" without a syllable of comment. Soulsby looked at the printed words a long, long time without remark. We, his visitors, sat on the ground near him and waited patiently. At length he turned to the title page and noted the date, 1856. Then he went on communing with himself. Finally, he closed the book, ran his rough hand through the enormous shock of iron-gray hair that thatched his head and said very simply and briefly: "Now I bethink myself. There *was* a Duffield ranch. It was up beyant Confidence. Duffield was up there in 1854. The Ward Pike place we call it now."

There was little difficulty finding the Ward Pike place on the Sonora Pass road at about 4800 feet altitude. It seems a plausible inference that Bigelow, coming as a traveler into Sonora, would inevitably meet so showy and ubiquitous a character of the High Street as Duffield, and that Duffield took Bigelow to his mountain ranch. At Duffield ranch, Bigelow spent three days, May 10, 11, and 12, 1854, the year corresponding with the year named by Ben Soulsby. From the ranch as a base he must have made excursions upwards, since some of the species collected by him belong at higher altitudes than Duffield ranch. In his own account of the forest trees of California, it is unmistakable that Bigelow was "high up in the mountains east of Sonora (almost in the snowy regions)" (p. 26) and he further states that he was "fifteen or twenty miles southeast of Sonora, on the headwaters of the Stanislaus and Tuolumne rivers" (p. 24), but the only practicable direction eastward from Sonora he was likely to have traveled is northeast rather than "southeast." The Ward Pike place lies on the top of the ridge between the South Fork Stanislaus River and the North Fork Tuolumne River, truly northeastward from Sonora.

Duffield ranch then, or the region immediately above it, is the type locality for the following new species or varieties collected by Bigelow: *Philadelphus lewisii* var. *parvifolius* Torr., *Potentilla tridentata* (Torr.) Greene (*Horkelia tridentata* Torr.), *Sanicula tuberosa* Torr., *Phlox occidentalis* Durand ex Torr. [today generally considered a phase of *Phlox speciosa* Pursh], and *Allium tribracteatum* Torr. In addition, some nineteen other species are listed as of "Duffield's Ranch" by Torrey. One of these, *Pinus sabiniana*, is perhaps a slip on Torrey's part, since it is not found on the Sonora Pass road at this altitude. It may be noted that Bigelow himself in his account of the forest trees does not list Duffield ranch as a locality for *Pinus sabiniana*. The other species conform altitudinally, or one or two may have been collected a little below the ranch.

Soon after the last date mentioned in the itinerary as given above, Bigelow returned to the eastern United States and reported to his commanding officer in the War Department at Washington for filing his report of the expedition which is dated [but certainly not published in]

August, 1854. This report (in Pacific Railroad Reports, Vol. 4) consists first of a botanical narrative of the expedition from Napoleon on the Mississippi River, by boat up the Arkansas River to Fort Smith, Arkansas, thence overland to Los Angeles and San Pedro (pp. 1-16) and second of a description of the forest trees of the route (pp. 17-21) with a special section on "Descriptions of Valuable or Remarkable California Forest Trees" (pp. 21-26). One of the most interesting contributions made by Bigelow to the Report is a large map giving a botanical profile in color of the forest trees from Fort Smith to San Pedro. He also collaborated with George Engelmann in the preparation of the paper entitled "Description of the Cactaceae" (pp. 27-58, pls. 1-24) in which many of the more commonly known cactus species of our desert regions were first described and named.

In his honor, Asa Gray named the genus *Bigelovia* of the Compositae, a group now covered by other names. There were also dedicated to him *Clematis bigelovii* Torr., *Aster bigelovii* Gray, and *Linosyris bigelovii* Gray of New Mexico, but our commonest cholla, *Opuntia bigelovii*, a widespread cactus of the arid districts of southern California and adjacent areas, named for him by George Engelmann, will perhaps serve most widely to keep in mind a botanical traveler who was so fortunate as to view a considerable part of California while its native vegetation was still in nearly pristine freshness.

In 1860 Dr. Bigelow made his home in Detroit where he was placed in charge of the meteorological work of the Northern and Northwestern Lakes Survey. Some years later he was appointed surgeon to the Marine Hospital in Detroit and Professor of Medical Botany and Materia Medica in the Medical College. He lived in Detroit the remainder of his life and died there July 18, 1878.

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